Table 10
INITIAL TARGET CHANNEL CHARACTERISTICS

Reach	Average 100-yr Width (ft)	Average 100-yr Depth (ft)	Channel Slope	Sinuosity[1]
Rio Jesus Maria Subreach 2	500	40	0.12% - 0.14%	1.18
Hoppin Subreach 3	1600	30	0.12% - 0.14%	1.15
Dunnigan Hills Subreach 4	800	15	0.15% - 0.18%	1.05
Guesisosi Subreach 5	800	17.5	0.12% - 0.14%	1.05
Madison Subreach 6	900	17	0.19% - 0.21%	1.15
Hungry Hollow Subreach 7	1550	11	0.19% - 0.21%	1.10
Capay Subreach 8	1760	19	0.18% - 0.20%	1.04

Source: NHC, 1995.

[1] Sinuosity is channel length divided by valley length.

Table 11
Conditions, Techniques, and Countermeasure Design Considerations

Conditions	Countermeasure Techniques	References to Design Considerations[1]	Projects or Maintenance
Bank erosion, outside of bends; bend migration	Bank revetments, spur dikes, groins, hard points, toe protection, channel realignment	1, 2, 3, 4, 5, 7, 8, 10	Priority projects and maintenance
Bank erosion due to contraction through narrows or bridges	Guide banks, bank revetment, groin fields, bridge widening, smooth channel transitions, rock aprons	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Priority projects and maintenance
Channel braiding and meandering leading to bank erosion	Groin fields, bank revetment, selective bar skimming, biotechnical measures and strategic vegetative planting	1, 2, 3, 4, 7, 8, 10	Priority projects and maintenance
Degradation	Grade controls, rock sills, channel bed lining, gabions, toe protection, discharge control	1, 2, 4, 5, 6, 8, 9, 10	Priority projects and maintenance
Aggradation and large bar accumulation	Annual maintenance, selective bar skimming, channel narrowing with groins and terraces	1, 2, 5, 8	Annual maintenance
Upstream nick point migration	Rock sills, grade controls, vegetative plantings	1, 2, 4, 5, 8	Priority projects and maintenance
Pier scour at bridges	Rock pillows around piers, grade controls, concrete or rock mattresses, bridge pier modifications, widen the bridge	5, 6, 9	Priority projects and maintenance
Scour holes, depressions	Vegetation, localized grading	2, 5, 7	Maintenance
Emergency bank repair	Rock rip rap, windrow revetments	1, 3, 4, 5, 6, 8, 9, 10	Emergency repair and maintenance

[1] DESIGN REFERENCES

1. U.S. Army Corps of Engineers, *Engineering and Design: Hydraulic Design of Flood Control Channels. Engineering Manual EM 1110-2-1601*, 1991.
2. U.S. Army Corps of Engineers, *Engineering and Design: Channel Stability Assessment For Flood Control Projects. Engineering Manual, EM 1110-2-1418*, 1994.
3. U.S. Department of Transportation, *Use of Riprap for Bank Protection. Hydraulic Engineering Circular No.11*, Federal Highway Administration, 1967.
4. Brown, Scott A. and Eric S. Clyde, *Design of Riprap Revetment. Revised Hydraulic Engineering Circular No.11*, Federal Highway Administration, Office of Implementation, 1989.
5. U.S. Department of Transportation, *Stream Stability at Highway Structures. Hydraulic Engineering Circular No.20*, Federal Highway Administration, 1990.
6. U.S. Department of Transportation, *Evaluating Scour at Bridges. Hydraulic Engineering Circular No.18*, Federal Highway Administration, 1990.
7. Gray, Donald H. and Andrew T. Leiser, *Biotechnical Slope Protection and Erosion Control*, Van Nostrand Reinhold Company, 1982.
8. U.S. Army Corps of Engineers, *Final Report to Congress: The Streambank Erosion Control Evaluation and Demonstration Act of 1974 Section 32, Public Law 93-251: Main Report and Appendices*. U.S. Army Corps of Engineers, 1981.
9. Neill, C.R., *Guide to Bridge Hydraulics*. Project on Bridge Hydraulics, Roads and Transportation Association of Canada, 1973.
10. Caltrans, *Bank and Shore Protection in California Highway Practice*, State of California, Department of Transportation, 1970.

Table 12
CACHE CREEK BASIN STREAM GAGING STATIONS

Location	Drainage Area (mi^2)	Period of Record Used	Length of Record Used (year)	Average Annual Runoff (acre-ft)	Average Annual Yield (acre-ft/mi^2)	Average Annual Discharge (cfs)	Station Operator
Cache Creek near Lower Lake	528.0	1944-1991	47	256,000	484.8	350	USGS
North Fork Cache Creek at Hough Springs near Lower Lake	60.2	1971-1991	20	67,900	1127.9	95	USGS
North Fork Cache Creek near Lower Lake[1]	197.0	1930-1981	52	136,500	692.9	185	USGS
Bear Creek near Rumsey[1]	100.0	1958-1980	23	35,760	357.6	50	DWR, CA
Cache Creek above Rumsey[1]	955.0	1965-1986	19	541,200	566.7	755	DWR, CA
Cache Creek near Capay[1]	1044.0	1942-1976	35	556,900	533.4	770	USGS
Cache Creek at Yolo	1139.0	1903-1993	91	378,900	332.7	520	USGS

Source: COE, 1994, Westside Tributaries Study, August.

[1] Stream gage recorder discontinued.

Table 13
RIPARIAN VEGETATION TYPES, LOWER CACHE CREEK

Vegetation Type	Acreage
Valley oak forest	76
Cottonwood forest	39
Mixed riparian forest	85
Willow scrub	821
Nonwoody riparian vegetation	364
Freshwater marsh	7
Seasonal wetland	84
Ruderal (weedy) wetland	20
Gravel wash (unvegetated gravel bars)	543
Artificial wetlands	1,221
TOTAL	3,260

Table 14 Data Compilation, Storage, and Analysis Summary

Measurement Type	Data Compilation	Data Storage	Data Analysis
Water Discharge, Continuous	Review collected data and compute discharge from stage readings using current rating. Relationship inspect gage weekly for proper operation. Data compilation for Rumsey and Yolo gages is performed by DWR and USGS. Compiled data is 'provisional'.	Store provisional data in tabular digital format. Data collected will be stage measurements, with a computed discharge for each time interval.	Use discharge measurements to adjust gage ratings as necessary. Provisional discharges may need to be recomputed due to adjustments. Make annual review of data and compute mean daily, mean monthly, and annual discharges. Publish reviewed data in May and November of each year. Record annual maximum and minimum discharge by water year in a separate table containing annual maxima and minima over the period of record. (Data analysis for Rumsey and Yolo gages is performed by DWR and USGS). Additional analysis may be requested by the TAC.
Water Discharge, Field Measurements	Record field measurements on standard forms, and transfer measured discharge, channel conditions, width, cross sectional area, mean velocity, stage, discharge condition (e.g., incr./decr.), number of sections, and time and date of measurement to a database.	Store field measurement forms in hard copy, store record of discharge measurements in County database.	Compare field measurements to gage rating in use. The TAC may determine that additional field measurements are needed where a rating shift is evident.
Sediment Measurements	Record sample collection date, conditions, discharge, velocity, and collection methods on standard forms Review laboratory results. Compute total suspended load from discharge weighted samples and laboratory concentrations. Enter sample date, discharge, mean velocity, collection methods, total suspended sediment concentrations, key sediment gradation parameters (D16, D50, and D84), and computed total suspended load in County database. Review laboratory analyses of bed load samples and record in County database. Enter sample date, discharge, collection methods, mean velocity, bed load measurements, key gradation parameters, and computed total bed load in County database.	Store field measurement forms in hard copy format; store compiled suspended and bed load sediment data in County database.	Plot suspended sediment load data against discharge at each station and compare to current sediment discharge rating curve. Plot bed load against discharge in the same format. Plot ratio of bed load to suspended load against discharge and compare to relations in use for computation of total load from suspended sediment load. After TAC review of analyses above, compute daily total, suspended, and bed load discharges using mean daily flows and relationships for sediment loads versus discharge developed by TAC. Compute annual loads.
Bed Material Samples	Record field sampling locations and conditions on standard forms. Review laboratory results. Enter date, sample location, and key gradation parameters in County database.	Store field forms in hard copy format; store laboratory results in County database.	Plot D16, D50, and D84 against stream longitudinal station. Plot D16, D50, and D84 for each reach against data for all previous years of record.